REMARKS/ARGUMENTS

Claims 1-3, 5-16 and 18-33 are pending herein. Claims 9-15 and 19-32 have been withdrawn in view of the election made with traverse to prosecute claims 1-8 and 16-18. Claims 4 and 17 have been cancelled hereby without prejudice or disclaimer. Claims 3, 5, 6, 8 and 18 have been amended hereby to correct matters of form and for clarification purposes only. New claim 33 has been added hereby as supported, for example, by original claims 4, 5 and 7.

In addition, independent claims 1 and 16 have been amended to more specifically recite the respective materials of the ceramic porous body and the ceramic dense body. Applicants respectfully submit that support for rewritten claims 1 and 16 can be found on page 19, lines 7-18 and page 19, lines 3-6 and 20-22 of the specification, for example, and that no new matter has been added.

1. Claims 1, 4, 5, 7, 8 and 16-18 were rejected under §102(b) over JP '077. Applicants respectfully traverse this rejection.

Independent claim 1 recites a laminated sintered body comprising a ceramic porous body having a thickness of 300 μ m or larger and comprising a material selected from the group consisting of a lanthanum-containing perovskite-type complex oxide, platinum-zirconia cermet, palladium-zirconia cermet, ruthenium-zirconia cermet, nickel-zirconia cermet, platinum-cerium oxide cermet, palladium-cerium oxide cermet, ruthenium-cerium oxide cermet and nickel-cerium oxide cermet. The laminated sintered body also comprises a ceramic dense body having a thickness of 25 μ m or smaller and comprising a material selected from the group consisting of yttria-stabilized zirconia, yttria partially-stabilized zirconia, cerium oxide and lanthanum chromite. The laminated sintered body has a helium leakage rate of 10^{-6} Pa $\cdot$ m^3/s or lower.

Independent claim 16 recites a ceramic laminated sintered body comprising a ceramic porous body having a thickness of at least 300 μ m and a ceramic dense body having a thickness of 25 μ m or less obtained by a method comprising the steps of providing a green body for a ceramic porous body comprising a material selected from the group consisting of a lanthanum-containing perovskite-type complex oxide, platinum-zirconia cermet, palladium-zirconia cermet, ruthenium-zirconia cermet, nickel-zirconia cermet, platinum-cerium oxide cermet, palladium-cerium oxide cermet, ruthenium-cerium oxide cermet and nickel-cerium oxide cermet, and providing a green body for a ceramic dense body comprising a material selected from the group consisting of yttria-stabilized zirconia, yttria partially-stabilized zirconia, cerium oxide and lanthanum chromite. The method also includes the steps of laminating the green bodies for the ceramic porous body and the ceramic dense body to obtain a laminate, subjecting the laminate to pressure molding by cold isostatic pressing to obtain a pressure molded body, and sintering the pressure molded body to obtain the laminated sintered body.

Applicants respectfully submit that JP '077 does not disclose or suggest a ceramic porous body comprising the materials now recited in claims 1 and 16. Since the applied reference does not disclose each and every feature of independent claims 1 and 16, Applicants respectfully submit that independent claims 1 and 16 define patentable subject matter over JP '077. Moreover, Applicants respectfully submit that all claims depending directly or indirectly from independent claim 1 and 16 likewise define patentable subject matter over JP '077 at least by virtue of their respective dependencies from independent claims 1 and 16.

For at least the foregoing reasons, Applicants respectfully request that the above rejection be reconsidered and withdrawn.

2. Claims 1-4, 6, 7, 16 and 17 were rejected under §103(a) over Nishi. Applicants respectfully traverse this rejection.

Independent claims 1 and 16 are discussed above in section 1.

The PTO admitted that Nishi does not expressly disclose the claimed helium leakage rate, and asserted that Nishi's interconnector "would inherently have a helium leakage rate falling within the claimed range" and specifically cited to paragraph 0063 of the publication of the present application, and paragraph [0169] of Nishi to support this assertion (see Office Action, page 4, lines 6-8). Applicants respectfully submit, however, that it is improper for the PTO to assert that an otherwise undisclosed feature would inherently be present in an applied reference in an effort to establish a rejection based on obviousness. Moreover, Applicants respectfully submit it is also improper for the PTO to cite to the pending application to support this rejection.

Even in view of the above, Applicants respectfully submit that one of ordinary skill in the art would not have had any reason to expect that Nishi's interconnector would "inherently" be in the claimed helium leakage rate range based only on the disclosure in Nishi. In fact, Applicants respectfully submit that the disclosure in Nishi tends to show otherwise.

For example, Applicants respectfully submit that according to Nishi, the interconnector must be sufficiently dense to prevent the passage of a gas (see Nishi, paragraph [0005]). This object is solved by using a material comprising a matrix of $MTiO_3$, where M is an alkaline earth metal (see Nishi, paragraph [0013]). Nishi's Fig. 45 shows the tested gas leak results of batteries having interconnectors composed of $Mg_{0.9}$ - $La_{0.1}$ - TiO_3 systems (see Nishi, paragraphs [0169]-[0171]), and also shows the tested gas leak results of a battery having an interconnector composed of lanthanum chromite. The disclosure in Nishi shows that batteries having interconnectors composed of $Mg_{0.9}$ - $La_{0.1}$ - TiO_3 system materials had a

tested gas leak of slightly below 2%, whereas the battery having an interconnector composed of lanthanum chromite, on the other hand, had a gas leak of nearly 40% (about 38%).

In view of the above, Applicants respectfully submit that the disclosure of Nishi would actually direct those skilled in the art in the opposite direction from that of the present invention, that is, away from using lanthanum chromite, as recited in claims 1 and 16.

Further, Applicants respectfully submit that there is a significant difference between the method of measuring the helium leakage rate according to the present invention and the (gas hydrogen) leakage rate percentage reported in Nishi. That is, Applicants respectfully submit that the "gas leak" percentage discussed in paragraphs [0169]-[0171] of Nishi actually refers to air or hydrogen, but not helium, as claimed.

According to Nishi, hydrogen is flown inside the battery and air is flown outside the battery. The leakage amount of hydrogen to the air side was the gas leak rate percentage that was measured and reported (see Nishi, paragraph [0170]). Applicants respectfully submit that in Nishi, the air side of the battery is held at atmospheric pressure, and that this method merely measures the amount of hydrogen that is diffused through the interconnector toward the air side under the specific condition that the air is at atmospheric pressure. That is, Applicants respectfully submit that each measured leakage rate percentage in Nishi represents a concentration percentage of hydrogen that is diffused to the air side for the different interconnector materials.

On the other hand, according to the present invention, the helium flow rate was measured under the conditions that helium is flown in one side and a vacuum state is provided on the other side. The helium leakage rate is the flow rate of helium per second from the helium side to the vacuum side. This method measures the leakage rate to the vacuum side

and does not measure the rate of diffusion of helium under the condition that air is flown in one side, as is the case with the "gas" in Nishi.

Moreover, Applicants respectfully submit that it is impossible to directly compare the claimed helium flow rate and the concentration of hydrogen in the air reported by Nishi. Applicants respectfully submit that the unit Pa · m^3/s is a unit that represents the flow rate per second of helium gas under the conditions described above. Even so, the following calculation could be taken into consideration. That is, in Nishi, one liter per minute of air is flown in the air side at atmospheric pressure (1atm:105Pa). The rate of one liter per minute is $1.67\times10^{-5}m^3/s$. If 38% of the hydrogen would be leaked and contained on the air side, as in the case using a lanthanum chromite interconnector according to Nishi's Fig. 45, the amount of hydrogen passed through the battery would be calculated as follows:

leakage rate = 105 Pa × $1.67\times 10^{-5}m^3/s$ × 0.38 = 0.67×10^{-3} Pa· m^3/s.

If Nishi's leakage rate would have been measured according to the above method using a helium leakage detector as the case in the present invention, Applicants respectfully submit that Nishi's leakage rate should have been sufficiently larger than 0.67×10^{-3} Pa· m^3/s. Applicants respectfully submit that this is because the leakage rate of the present invention is measured under the very severe condition that helium gas is leaked to the vacuum side, not to the air side.

For at least the foregoing reasons, Applicants respectfully submit that one of ordinary skill in the art would not have had any reason to expect that Nishi's interconnector would inherently, or even could possibly have the claimed helium leakage rate in view of the disclosure in Nishi, which is further evidenced by the fact that the PTO tried to rely on the disclosure in the present specification in order to make that incorrect assertion in the first place.

For at least the foregoing reasons, Applicants respectfully submit that independent claims 1 and 16, and all claims depending directly or indirectly therefrom, define patentable subject matter over Nishi. Accordingly, Applicants respectfully request that the above rejection be reconsidered and withdrawn.

3. Claim 2 was rejected under §103(a) over JP '077. Applicants respectfully traverse this rejection.

Claim 2 depends from independent claim 1, which is discussed above in section 1. Since independent claim 1 defines patentable subject matter over JP '077 for the reasons explained above, Applicants respectfully submit that claim 2 likewise defines patentable subject matter over the applied reference at least by virtue of its dependency from independent claim 1. Accordingly, Applicants respectfully request that the above rejection be reconsidered and withdrawn.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

December 2, 2005
Date

Stephen P. Burr
Reg. No. 32,970

Nicole J. Buckner
Reg. No. 51,508

SPB/NB/gmh

Attachments: Appendix A - substitute specification
Appendix B - marked-up specification

BURR & BROWN
P.O. Box 7068
Syracuse, NY 13261-7068

Customer No.: 025191
Telephone: (315) 233-8300
Facsimile: (315) 233-8320